

ABSTRACT OF THE DISCLOSURE

A device for generating blue or green laser light by the use of a device comprising an infrared high power semiconductor laser or an infrared high power semiconductor laser bar or array, a diffractive optical device, and an optical device utilizing a non-linear crystal to generate the blue or green laser light. In one embodiment, the diffractive optical device comprises a volume holographic transmission grating and the optical device comprises a ring resonator. In another embodiment, the diffractive optical device comprises a reflective diffraction grating feedback mechanism and the optical device comprises a ring resonator. In another embodiment, the optical device comprises a parabolic or non-planar feedback mechanism and a ring resonator. In another embodiment, the diffractive optical feedback device, which can be in the form of digital/binary optics, is attached to the semiconductor laser source. In yet another embodiment, the diffractive optical device comprises a hybrid lens comprising a plano-convex lens and a diffractive device, which also can be in the form of digital/binary optics, attached thereto. And in yet another embodiment, a pump configuration is used to amplify a corrected single mode laser beam with higher input power of laser bar or array to feed a nonlinear material to create a very high-powered blue or green laser beam. The above-described embodiments for generating continuous blue or green laser light provide a reliable, low-cost device having a relatively simple construction.

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